Spring 1995

Human Performance Lab Newsletter, Spring 1995

St. Cloud State University

NEWS

HUMAN PERFORMANCE LAB — SPIRIT BODY MIND — ST. CLOUD STATE UNIVERSITY

SPRING 1995

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KELLY'S CONRNER

By Dr. Jack Kelly

In years gone by the idea of keeping in shape was usually reserved for the young. More recently, however, we have come to understand that the need for maintaining reasonable levels of physical fitness is something common to all humans. In fact, the proverbial pendulum has been swinging; leading Many to believe that as we grow older more rather than less attention needs to be placed on health maintenance practices. Impressive facts and statistics have been compiled to support the contention that physical training is an important tool for helping us to remain healthy as we grow older. Pick nearly any medical problem and you'll be sure to and scientific evidence outlining the value of physical activity in its treatment and prevention. For example, when we go to the doctor most of us are a bit worried about what may be found out about our health. We are concerned about such things as cholesterol, heart disease, hypertension, diabetes, osteoporosis and cancer to name a few, We may also be concerned about our level of fatness since recent studies indicate that one-third of all Americans are over-fat. The number of medications prescribed for those problems is staggering. On the other hand, increased levels of physical activity may be the most important prescription our physicians could prescribe for these problems. What

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ACSM promotes Healthy People 2000

By Bryan Huft

How much exercise is enough? What constitutes healthy living? At the most recent meeting of the Northland Chapter of the American College of Sports Medicine [ACSM], students were given a preview of a nationwide program designed to answer some of these important questions.

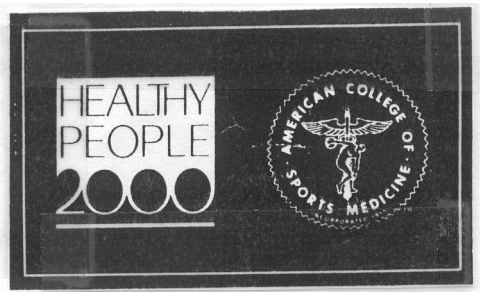
This program was designed by the Federal government and adopted by ACSM to promote several goals which target children; people with disabilities and the seasoned citizen, in order to accomplish these long-term objectives. ACSIVI aims to reduce heart disease, strokes, smoking, high cholesterol, blood pressure, and weight. How does ACSM seek to do this? HEALTHY PEOPLE 2000.

HP 2000's first objective targets children. They seek to increase to 50% the proportion of children in grades 1-12 who participate in daily physical education classes, citing the inadequacy of both quantity and quality of such programs.

The hope of this objective is not only to provide a fitness level for the child, but hopefully to develop an attitude of athleticism that will carry with them throughout their life. A second goal aims to increase to 50% the actual time spent in physical activity during these classes.

Goals aimed at people with disabilities include reducing to 20% those who live a sedentary lifestyle, citing the increased risks of metabolic, circulatory, respiratory, and musculoskeletal problems, caused by immobility and inactivity. Problems exist however, in trying to implement these goals, such as special equipment needed, new skill development and special support networks which allow participation.

Objectives for able-bodied adults include increasing moderate physical activity to at least 30% (from 20%) of the population, and to reduce sedentary lifestyles to no more than 15% (from 25%). Finally, to increase to 40% the proportion of people who regularly perform physical activity to enhance and maintain muscle strength, endurance and flexibility.



While the benefits of exercise seem obvious to many, ACSM is relying on people to add morel physical education classes in schools, additional employer sponsored activities, and more public recreation facilities. Primary care providers need to encourage their patients to employ a healthier lifestyle. In order to meet HP 2000's goals, it will take all of us to spread the message that the real gift of exercise is a better life.

Adopted from I Healthy People 2000, a National Health Promotion and Disease Prevention Objectives Report front the U.S. Department of Health and Human Services Public Health Service.

MEET THE NEW GRADUATE STUDENTS

Mark Blegen
Mark is a 1994 St. Olaf College graduate with a B.A. in sports science (sports medicine). Not only did Mark play football for four years, but he also served as a student trainer. His interests include all types of athletics, and even the fine arts! Mark was born in Worthington, MN and has two sisters, Kristy and Sarah, plus a dog named Zeke

Bryan Huft
Bryan is a 1988 Concordia College (Moorhead) graduate from Bismarck, N.D. His interests include running, traveling, WWII history, and his wife Becca. He plans to focus his master's studies on the cross-training effect of adding arm work to running or cross-country skiing, hoping to pursue a career in corporate fitness.

Danl Baker
Dani received her B.A. from St. Cloud in biomedical science in 1991. Dani has many interests outside the lab which include her boyfriend Brent, the outdoors, her job at Fitzharris Athletics, arts and crafts, and running. Dani has three brothers, Dallas, Darrick & Matt. Dan! hopes to possibly teach at a northern MN Community College or perhaps pursue a PhD

Sally Plante
Sally is married and has two boys. She did her undergraduate work in accounting, and has her CPA, along with a masters degree in business administration. Sally is currently working as an accounting instructor at St. John's University. She eventually would like to do her master's research on the effects of exercise on aging.

Paul Kammermeier
Paul is from Avon, MN and graduated from Albany High School. After graduating from the University of Colorado at Boulder and studying abroad in Bordeaux, France, he lived in Kyoto, Japan for four years where he taught English as a second language. Paul's interests include chess, wine, reading, and yoga.

Joe Vardas
Joe is a 1989 graduate of Pierz Healy High School and a 1994 graduate from St. Cloud State University where he majored in exercise science and community health. He was on the SCSU track team and now assists in coaching both at SCSU and Pierz Joe enjoys sports, music, and comedy!

Jamie Jerdee
Jamie is from Hayward, MN and is a graduate of Gustavus Adolphus College, where he majored in biology and health and fitness. Jamie worked as a rehabilitation exercise specialist at AM Health Physical Care in Maplewood. He was also an assistant football coach at Albert Lea High School. Jamie's interests include football, weightlifting, golf, and skiing.

Robyn Abear
Robyn is from Brainerd, MN and is a graduate of the University of St. Thomas, where she majored in corporate fitness - business. Robyn currently works as a personal trainer and fitness consultant at The Marsh in Minnetonka, MN. Her interests include figure skating, weightlifting, boating, and art.

Publications and Presentations

Bacharach, D. & Ekstrom, E. Fluids and Carbohydrate: What's Best? *Appl. Res. in Coach. Athl. Annual*, 248 - 257.1994

Bacharach, D. Intermediate & long term anaerobic performance of the elite alpine skier. Symposium: Interdisciplinary approach to the science of alpine skiing. Presented at the National ACSM meeting. June 1994.

Bacharach, D., Petit, M., & Rundell, K. Relationship of blood urea nitrogen to training of elite female biathlon skiers. Presented at the National ACSM meeting. June 1994.

Bacharach, D. Taylor, M. Street, G., Rundell, K. & Rundell M. Correlation of a 1 km double poling time trial to national rank of elite biathlon skiers. Presented at the AAHPERD National meeting. April 1994.

Gregory, R.W. , Humphreys, S.E. & Street, G.M. "Kinematic analysis of skating technique of Olympic skiers in the women's 30 km race." *Journal of Applied Biomechanics*, 10(4).1994.

Street, G.M. & Frederick, E.C. "Measurement of skier generated forces during roller ski skating." *Journal of Applied Biomechanics*, (in Press).

Street, G.M. & Gregory, R. W. "Relationship of Glide Speed and Olympic Performance." *Journal of Applied Biomechanics*, 10(4). 1994.

Taylor, M., Sanders, S., Kelly, J., & Bacharach, D. Effect of speed chute training on sprint performance. Presented at the National ACSM meeting. June 1994.

RECIPES

Is one of your New Year's resolutions losing some unwanted Kilograms? Then try some of these recipes out for less size!

Whole Wheat, Pancakes

Whole Wheat Flour	1 cup
Brown Sugar, Packed	2 tsp
Baking Powder	1- 112 tsps
Salt	1/8 tsp
Egg	1 large
Skim Milk	1 cup
Vegetable Oil	2 tsp

(apple sauce may be substituted for oil)

1. Preheat griddle
2. Mix dry ingredients
3. Beat egg, milk, and oil together.
4. Add milk mixture to stir only to mixed.

Per serving:
calories 175
Fat: 4 g
Cholesterol: 54 mg
Sodium: 265 mg

Wild, wild rice

Dried Mushrooms	1/2 cup
Water	2 1/2 cups
Salt	1/4 tsp
Wild Rice	3/4 cup
Long-grain wild rice	1/2 cup
Thyme	1/4 tsp
Sage	1/4 tsp
Pepper	1/8 tsp
pecans(chopped)	1/2 cup
parsley (minced)	1 tbsp

1. Rinse mushrooms and soak them 5 min. in hot water.
2. Bring water and salt to a boil, stirring in rice and mushrooms.
3. Simmer, cover, and cook for 1 hour, or until rice is done.
4. Remove from stove, stir in herbs and pepper.
5. Cover and let stand for 10 min. before serving.
6. Stir in toasted pecans and garnish with parsley. (Serves 4).

Per serving:
Calories: 203
Fat: I g
Cholesterol: 0 mg
Sodium: 127 mg

Kelly – cont'd

a miracle drug! ! Not only is it effective, but it also makes us feel good and has few negative side effects, yet another example demonstrating that the best things in life are free.

Another important benefit of exercise is that it keeps our muscles healthy and strong. Muscle accounts for about 40% of our mass and allows us to move about. As muscles become weak and flabby so does our ability to accomplish nearly every physical thing in our lives. For example, it is estimated that it requires about 50% of our leg strength to stand up from a chair. Have you observed an older person as they struggle to get out of a chair? Their struggle is caused by a weakened muscular system that must exert near maximal forces just to stand up. Unless steps are taken to improve strength, their ability to get up may be lost. Fortunately, in most cases this could be remedied with a modest exercise program. We have learned that we never grow too old to benefit from exercise.

Finally, a reminder as to how much exercise is necessary to reap healthful benefits. Recent studies have demonstrated that even small amounts of physical activity are beneficial, such as 5-10 minute walks. It would appear, however, that 3 - 4 exercise bouts per week lasting 20 - 30 minutes are required for healthy maintenance. The intensity of these workouts can vary from a comfortable pace to one that makes us perspire and breathe more deeply. On an intensity scale from 6 - 20, we would recommend an exertion level of 12 - 14. Keep up your activity because after all of these years, it remains the closest we have come to finding the fountain of youth.

Turn off the TV - Turn on the Fitness!

by Deb Meierhofer

There is evidence that the physical fitness levels of American children may be declining. A 1987 study by Gortmaker et al. found that the prevalence of obesity among children ages 6 to 11 increased 54% from 1965 to 1980, and that there was a 98% increase in super obesity. In 1989, Updile and Willett reported an approximate 10% decline in the aerobic fitness levels of children as measured by distance runs.

Results from the most recent National Children and Youth Fitness study (NCYFS 11, 1987) indicated that skinfold measurements of children in grades one through four were 2-4 mm thicker than those of children studied in a National Center for Health Statistics sample taken in the 1960's.

What causes obesity? Potential causes include genetics, inactivity, poor nutrition, and television viewing. Next to work and sleep, television viewing is the nation's third most time consuming activity! Recent surveys estimate that children watch-about 18 hours of TV each week - equal to 2 months of waking hours per year! Other sources suggest that this number may even be higher.

How can television viewing lead to obesity? For one reason, time that is spent in front of the TV is time that is not spent playing and being active. Muscular strength, including that of the heart, is not improved, and caloric expenditure is reduced. Also, television may promote increased food consumption through advertising.

Recently, researchers have begun to examine a possible link between TV and obesity. Studies have found that adults who watched 3 - 4 hours of TV per day were about twice as likely to be obese as those who watched less than 1 hour per day. Each hourly increment of TV viewing by adolescents was associated with a 2% increase in the prevalence of obesity. Children ages 6 to 11 who watched more TV were also more likely to be obese than those who watched less.

The relationship between TV and physical fitness ha, also been researched. Adults and adolescent males who watched less than 2 hours of TV each day were found to be significantly more fit than those who watched more than 4 hours each day. And one study found a significant relationship between both the mile walk./run and the sum of skinfolds, and the amount of TV watched by school-age children.

The subject of television viewing and its possible relationship to physical fitness is very interesting to me and one that I feel needs more research. I am currently working on my Masters Thesis, which hypothesizes that a greater amount of television viewing is associated with lower levels of physical fitness among fourth grade children. Physical fitness levels of the children will be determined by their performance of the mile walk/run (cardio-respiratory endurance), and the sum of two skinfolds: triceps and calf. Television viewing amounts of both the children and their parents will be determined through completion of a brief survey. In this survey I asked that time spent playing video games, such as Sega or Nintendo, and watching video tapes or movies be included as TV time.

Not only do I hope to show a relationship between TV and the physical fitness levels of children, but also to show a correlation between TV viewed by parents and that viewed by their children. These results could send out a strong message: Children need to turn the TV off and become more active if they are to be more physically fit, and parents, like myself, may need to start the ball rolling by watching less TV themselves.

Kuntzleman, C.T. & Reiff, G.G. The decline in American Children's fitness levels. *Research Quarterly for Exercise and Sport*. 63(2): 107 - 111, 1992.

Gortmaker, S.L. et al. increases in predictor obesity in the U.S. *A journal of diseases In children*. 141: 535 - 540, 1987.

Thesis in progress

Webb Smith, who is pursuing his Masters Degree in Biomechanics, is currently in his second year of graduate school. Like any second year student, Webb has devoted much of this year to completing his thesis. Having a strong interest in the sport of boxing, he decided to explore this topic for his thesis. While doing research, he discovered that many medical groups are attempting to ban boxing because they feel it is unsafe. Studies have shown that repeated blows to the head may lead to chronic brain damage and irreversible brain degeneration. Amateur boxing has taken steps to reduce injury by limiting each bout to 3 rounds, removing the extra point for a knockdown, and requiring all boxers to wear headgear. However, the headgear ha not been proven to be effective at significantly reducing the force of a punch Therefore, Webb's thesis will attempt to design a headgear which is more effective at reducing impact forces. The current headgear uses multi-layers of foam encased in soft leather; The thesis will test several materials and methods of shock attenuation in order to develop a more suitable headgear. These include materials which dampen high forces, such as the padding in shoes, as well as an air bladder system, which is currently used in football helmets. Hopefully, a more effective concept of reducing force can be applied to the headgear which would help protect athletes and improve the safety of boxing.

Financial Support

We greatly appreciate the financial support many of you have provided over the years. Tile money has been instrumental in helping the Human Performance Laboratory's programs. We are always so gratified to know that you believe in our work enough to personally invest in it.

Should you be in a position to make a contribution to the Human Performance Laboratory, please make checks payable to: SCSU Foundation-Adult Fitness,
Send Checks to.

SCSU Foundation
St. Cloud State University
Alumni & Foundation Center
720 4th Ave. South
St. Cloud, MN 56301-4498

Drink Up!

by Janice Engebretson

Did you know your body is about 60% water? Water is a crucial component of countless chemical reactions that take place in the body. Adequate amounts of water are necessary for energy production, temperature control (especially during exercise), and elimination of waste. Water also helps lubricate joints and protects tissues and organs from -shock. Normally, we lose about 2 1/2 quarts of water each day (via expired air, perspiration, urine and feces). At rest, most of this water loss can be replaced through beverages we drink and from moisture in solid foods we eat. But when we are active, we need to pay even more attention to water replacement.

During exercise, our demands for water increase since we are losing more water through perspiration. Water loss can be as much as 6-7 quarts during periods of intense exercise in a hot environment. The body needs to dissipate heat produced by exercise so the internal temperature does not go too high. Evaporation of sweat produces a cooling effect and is the body's main defense against overheating. If the water lost through evaporation is not replaced, dehydration occurs. A 2% drop in body weight due to water loss can reduce performance, and further losses can lead to cramps, heat exhaustion and/or heat stroke. Since water losses exceeding 3% of bodyweight are considered to be potentially harmful, it is best to drink water before, during and after exercise to maintain water balance. Normally, one's own thirst mechanism is sufficient to replace lost fluids; however, when exercising, particularly in a hot environment, thirst is not enough to stimulate adequate fluid replacement. Therefore, we should plan to drink water before we get thirsty.

For exercise workouts under normal temperature (50- and lasting less than 90 minutes, cold water is the best fluid to drink because it leaves the stomach faster than warm fluids, and it also helps reduce the body's internal temperature. Drinks which contain too much sugar are absorbed more slowly and are therefore less effective as a fluid replacement. When exercising in a hot environment, drink 2-3 hours before your workout and an additional 1-2 cups about 15 minutes before exercising. During your workout, drink 1/2 - 1 cup of water every 10-15 minutes. One way to monitor water loss is to weigh in before and after a workout. For each pound of body weight lost, drink two cups of fluid.

Drinking plenty of water, both at rest and during exercise, will maintain the proper water balance our bodies need and help prevent heat injury.

Powers, S.K. Howley, E.T. Exercise Physiology-Theory and Application to Fitness and Performance, 1990, Wm. C. Brown Publishers, Dubuque, IA.

A SPECIAL THANK YOU

We extend a sincere thank you to the many friends of Brady Watts who contributed to the Adult Fitness Program in his memory. We are truly appreciative to his family for identifying our program for these memorials.

OUR GRATITUDE

The staff and students at the Human Performance lab would like t0:thank the follow people for their contributions to the Adult Fitness Program in 1994:

Mr. & Met. Allan Andreotti
Drs. David & Nancy Bacharach
Central Collection Service Inc
Dr. & Mrs. Ray Collins
Mr. & Mrs Ron Cochran
Dr. & Mrs. Dennis Fields.
Mr. & Mrs. James Gammell
Mr.& Mrs. Curtis Ghylin
Mr. John Grogan
Dr. Abdalla Hanafy & Earleen Hellglein-Hanafy
Dr Jeffrey Holmberg
Mr. & Mrs. Rick Jones
Mr. & Mrs. Lee Kasper
Dr. & Mrs. John Kelly
Mr. & Mrs. David Kunze
Mr. & Mrs. Tom Lembeck
Mr. & Mrs. Roger Moran
Dr. Ruth Nearing
Dr. Harry Olson
Dr. & Mrs. Frank Osendorf
Dr.& Mrs. John Pike
Ms. Sally Plante
Ms. Judith Seitz.
Mr. & Mrs. Les Sova
Dr & Mrs. Glenn Street
Dr. Dee Whitlock
Ms. Joyce Wehlage

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The Scoop on Caffeine

by Paul Kamrnermeier

Here are a few tidbits of interest to coffee achievers and novices alike, found it) recent literature:

- Caffeine is probably the most commonly consumed drug in North America and Europe.
- There is a wide variety of reactions to caffeine by different people, tolerance build-up and corpulence being significant factors.
- There is no evidence that moderate amounts of coffee (300mg/day, or less than 15oz.), are harmful.
- Caffeine widens some vessels and constricts others (it may help asthma sufferers).
- Ingesting caffeine within one hour after a meal may make it harder to absorb iron, creating a problem for anemics.
- Caffeine can cause problems in pregnant women and can pass to breast milk, which the baby ingests.
- Small doses, usually within International Olympic Committee limits, usually are of benefit to athletes; large doses are not.
- Muscles with a majority of slow-twitch fibers are much more sensitive to the effects of caffeine than muscles with a majority of fast-twitch fibers.

Some of the latest research also discovered that the combination of caffeine and cold weather resulted in increased metabolism of fatty acids and decreased metabolism of carbohydrates. Unfortunately for some, the effects were not as noticeable in highly trained individuals. Also of interest to endurance athletes is that some evidence suggests that caffeine actually enhances endurance. However, this may be attributable to the attenuation of pain as opposed to other factors. Furthermore, caffeine may increase muscle tension at low frequencies of stimulation, as well as facilitate muscle contraction through potentiation of calcium release in the sarcoplasmic reticulum.

Finally, a few words of advice for the endurance athlete:

- Abstain from coffee for four days prior to an event; drink it 3-4 hours before performing, when blood plasma fatty acids are at peak concentration. Peak caffeine concentration occurs one hour after ingestion.
- Try caffeine under training and regular conditions before you enter an important race.
- Remember that dehydration can be a factor in endurance events, and that caffeine is a diuretic.
- Do not abstain from caffeine for a race if you're a habitual consumer of it.